

Heavy-Duty Trucks and Global Warming

Clean Vehicles California

A Fact Sheet of the Union of Concerned Scientists

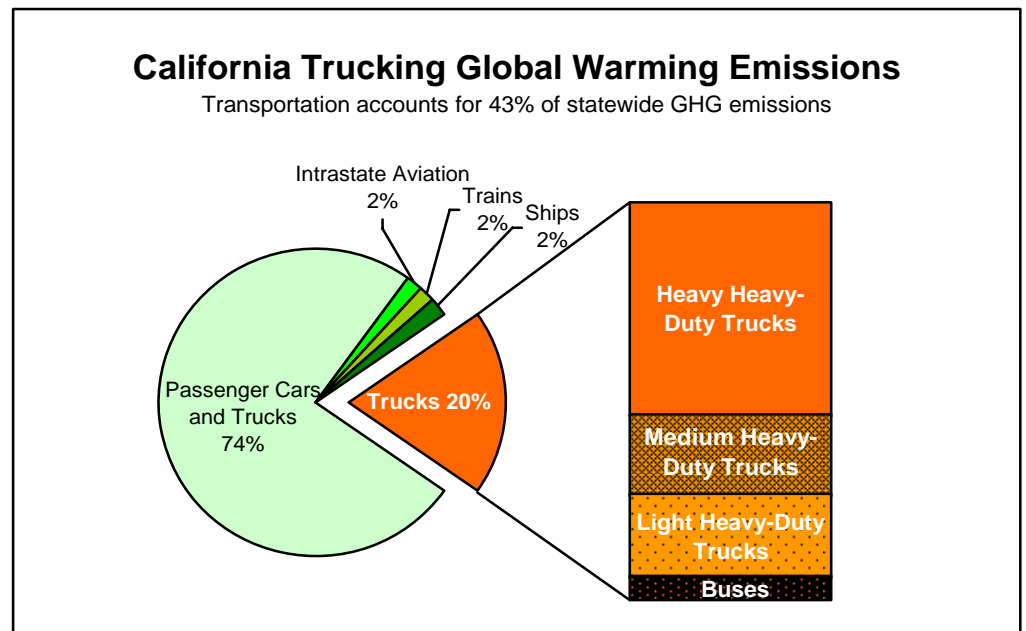
In California, heavy-duty trucks are responsible for one-fifth of the global warming pollution from the transportation sector. Opportunities for significant reductions in greenhouse gas emissions from heavy-duty trucks are available and many solutions offer co-benefits of reduced fuel consumption, lower operating costs, and reduced smog-forming emissions. By choosing the most efficient truck models available, installing aerodynamic devices, and using more efficient tires, many truckers can immediately slash global warming pollution by more than 10 percent and put money in their pockets instead of paying at the pump.

While many technologies are available in the marketplace today, widespread adoption of them has not occurred. The California Air Resources Board adopted a regulation requiring some new and existing trucks and trailers to be equipped with available greenhouse gas-reducing technologies. This greenhouse gas truck regulation will help drive demand for lower emitting tractor-trailers, promote the development of new and improved technologies by equipment manufacturers, and accelerate the adoption of greenhouse gas-reducing and fuel-saving technologies throughout the trucking industry.

Global Warming Emissions

The greenhouse gas emissions emitted from heavy-duty trucks, primarily in the form of carbon dioxide, contribute to global warming. If global warming continues unabated, California is expected to face a sharp rise in extreme heat, a less reliable water supply, more dangerous wildfires, and expanding risks to agriculture. As temperatures rise, the frequency and severity of heat waves will grow—as will the potential for bad air days. The risk of illness and death due to dehydration, heart attack, stroke, and respiratory disease will increase as a result. Those most likely to suffer are children, the elderly, and other vulnerable populations.

The transportation sector is the largest source of global warming pollution accounting for 43 percent of total emissions in California. Heavy-duty trucks and buses are responsible for 20 percent of all transportation sector greenhouse gas emissions, second only to passenger cars.



California Air Resources Board *Draft California Greenhouse Gas Inventory*, November 17, 2007

The Heavy Heavy-Duty trucks category includes big-rig tractor-trailer, refuse, cement, and dump trucks, with a gross vehicle weight rating (GVWR¹) greater than 33,000 lbs. These trucks contribute 50 percent of the global warming pollution from the truck and bus category, accrue the greatest mileage, and consume a majority of the fuel. Tractor-trailer combination trucks used to haul freight long distances or regionally are by far the largest emitters in this category. Every day in California, these large trucks travel 30 million miles and burn more than 5 million gallons of diesel fuel.²

Trucks in the Medium Heavy-Duty category include large delivery trucks, tow trucks, and beverage trucks while trucks in the light heavy-duty category include small delivery trucks, large pick-up trucks, and SUVs. Many of these trucks can benefit from technology improvement developed for light-duty passenger vehicles including hybridization.

Global Warming Solutions

If freight transportation in California continues on a business-as-usual course, a 40 percent increase from today's truck global warming pollution is expected by 2020.³ Under the California Warming Solutions Act of 2006 (AB 32), California is obligated to reduce its total greenhouse gas emissions to 1990 levels by 2020. For trucks to do their fair share in meeting these requirements, expected growth in global warming pollution from heavy-duty trucks must not only be slowed, but reversed significantly. Otherwise, additional and potentially costly reductions may need to be found from other sources.

Fortunately, there are existing technologies available today that can reduce global warming pollution from heavy-duty trucks. Tractors and trailers can be retrofitted with devices to improve aerodynamics and reduce the need for idling. Hybrid technology will provide large improvements in greenhouse gas emissions for many truck applications, while all trucks can benefit from better performing tires with lower rolling resistance.

Most technologies which reduce global warming pollution of trucks also reduce fuel use and operating costs, resulting in cost savings to the operator. Additionally, technologies that reduce greenhouse gas emissions and improve fuel economy can also reduce nitrogen oxide emissions, a key component in smog formation.⁴ A more detailed description of technologies is available in our truck technology fact sheet:

http://www.ucsusa.org/assets/documents/clean_vehicles/Technology-Options-for-Tractors-and-Trailers.pdf

State Rule Development

To help accelerate adoption of the technologies that reduce GHG from heavy-duty trucks, the California Air Resources Board adopted a regulation in December 2008. This regulation is the first of its kind to expressly address GHG from heavy-duty trucks. Successful implementation of this measure will reduce diesel fuel consumption, truck operating costs, and nitrogen oxide emissions, as well as accelerate industry adoption of existing technologies to reduce greenhouse gases. It is a first step in moving towards a more sustainable freight transportation system and to meeting our climate obligations under AB 32.

For more information on CARB's Truck GHG regulation, visit <http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm>



Tractor-trailer trucks consume more fuel and emit more global warming pollution than any other category of truck. Many of these trucks travel over 100,000 miles annually, consuming more than 16,000 gallons of diesel fuel per year. Small improvements in fuel economy can result in significant fuel cost savings and greenhouse gas reductions.

¹ Gross Vehicle Weight Rating is the measure of the total vehicle weight plus the rated payload capacity.

² California Air Resources Board *EMFAC 2007*

³ California Energy Commission *Inventory Of California Greenhouse Gas Emissions And Sinks: 1990 To 2004*, December 2006 page 101. Percentage increase based on on-road diesel CO₂ emissions from 2004 to 2020.

⁴ Bachman, Joseph L., et al., *Effect of Single Wide Tires and Trailer Aerodynamics on Fuel Economy and NO_x emissions of Class 8 Line-Haul Tractor-Trailers*, SAE Paper Number 05CV-45, 2005.

